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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,147	09/06/2005	Hiroshi Yamada	124683	9782

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EXAMINER	
LIU, BENJAMIN T	
ART UNIT	**PAPER NUMBER**
2826	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/542,147	YAMADA ET AL.	
	Examiner	Art Unit	
	Benjamin T. Liu	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 January 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Minhloan Tran
Primary Examiner
Art Unit 2826

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claim 1-17 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5, 7-14, and 18-20 are rejected under 35 U.S.C 103(a) as being unpatentable over Saitoh et al. (5,741,615) in view of Morimoto et al. (4,539,054).

With regard to claim 1, Saitoh et al. '615 discloses a photoelectric transducer comprising a first pin junction part including: a first p-layer; a first n-layer disposed so as to oppose the first p-layer; and a first i-layer, disposed between the first p-layer and first n-layer, containing an iron atom, a silicon atom bonded to the iron atom, and a hydrogen atom. (Note abstract, lines 28-32 in column 3, lines 19-35 in column 8, lines 10-12 in column 24, lines 44-50 in column 24, and lines 66 in column 24 to lines 15 in column 25 of Saitoh et al. '615)

Saitoh et al. '615 does not discloses the limitation, wherein a composition ratio between the iron atom and silicon atom in the first i-layer is in a range from 1:1.7 to 1:3.5.

However, Morimoto et al. discloses the limitation, wherein a composition ratio between the iron atom Fe and silicon Si atom in an amorphous layer is in a range from 1:1.7 to 1:3.5 ("$FeSi_2$"). (Note lines 58-68 col 3)

Therefore, it would have been obvious to one of ordinary skill in the art to form the transducer of Saitoh et al. '615 with the limitation of ~~Shannon~~ Morimoto et al. in order to have excellent electrical and optical characteristics.

With regard to claim 2, Saitoh et al. '615 discloses the first i-layer is formed by at least partly bonding the hydrogen atom to the silicon atom or iron atom. (Note lines 32-33 in column 4 of Saitoh et al. '615)

With regard to claim 3, Saitoh et al. '615 discloses the first i-layer is mainly amorphous. (Note lines 45-48 in column 24 of Saitoh et al. '615)

With regard to claim 4, Saitoh et al. '615 discloses the first i-layer has a hydrogen atom content of 1 to 25 atom %. (Note abstract of Saitoh et al. '615)

With regard to claim 5, Saitoh et al. '615 discloses the first pin junction part further comprises a second i-layer disposed between the first p-layer and first n-layer and constituted by a mainly amorphous silicon film. (Note lines 45-48 in column 24 of Saitoh et al. '615)

With regard to claim 7, Saitoh et al. '615 discloses a photoelectric transducer apparatus comprising: a substrate 101 (figure 1 & 9); a first electrode layer (no part #,

"substrate applied with electroconductive treatment" lines 9-12 col 6) disposed on one side of the substrate 101; a second electrode layer (no part #, "an upper electrode" lines 14-15 col 25) disposed so as to oppose the first electrode layer; and a first pin junction part including a first n-layer (no part #, "a-Si layer having an n-type conductivity" lines 18-19 col 24) formed on the first electrode layer, a first p-layer (no part #, "a-Si layer having a p-type conductivity" lines 7-8 col 25) formed on one side of the second electrode layer so as to oppose the first n-layer, and a first i-layer (no part #, "a-Si layer" line 46 col 24), disposed between the first p-layer and first n-layer, containing an iron atom, a silicon atom bonded to the iron atom, and a hydrogen atom. (Note abstract of Saitoh et al.)

Saitoh et al. '615 does not discloses the limitation, wherein a composition ratio between the iron atom and silicon atom in the first i-layer is in a range from 1:1.7 to 1:3.5.

However, Morimoto et al. discloses the limitation, wherein a composition ratio between the iron atom Fe and silicon Si atom in an amorphous layer is in a range from 1:1.7 to 1:3.5 ("$FeSi_2$"). (Note lines 58-68 col 3)

Therefore, it would have been obvious to one of ordinary skill in the art to form the transducer of Saitoh et al. '615 with the limitation of Morimoto et al. in order to have excellent electrical and optical characteristics.

With regard to claim 8, Saitoh et al. '615 discloses an iron silicide film for constructing an i-layer (no part #, "a-Si layer" line 46 col 24) in a pin (no part #, "pin structure" line 14 col 25) junction; the iron silicide film containing an iron atom, a silicon

atom bonded to the iron atom, and a hydrogen atom while being mainly amorphous. (Note abstract, lines 28-32 in column 3, lines 19-35 in column 8, lines 10-12 in column 24, lines 44-50 in column 24, and lines 66 in column 24 to lines 15 in column 25 of Saitoh et al. '615)

Saitoh et al. '615 does not discloses the limitation, wherein a composition ratio between the iron atom and silicon atom in the first i-layer is in a range from 1:1.7 to 1:3.5.

However, Morimoto et al. discloses the limitation, wherein a composition ratio between the iron atom Fe and silicon Si atom in an amorphous layer is in a range from 1:1.7 to 1:3.5 ("$FeSi_2$"). (Note lines 58-68 col 3)

Therefore, it would have been obvious to one of ordinary skill in the art to form the transducer of Saitoh et al. '615 with the limitation of Morimoto et al. in order to have excellent electrical and optical characteristics.

With regard to claim 9, Saitoh et al. '615 discloses the first i-layer is mainly amorphous. (Note lines 45-48 in column 24 of Saitoh et al. '615)

With regard to claim 10, Saitoh et al. '615 discloses the first i-layer has a hydrogen atom content of 1 to 25 atom %. (Note abstract of Saitoh et al. '615)

With regard to claim 11, Saitoh et al. '615 discloses the first i-layer has a hydrogen atom content of 1 to 25 atom %. (Note abstract of Saitoh et al. '615)

With regard to claim 12, Saitoh et al. '615 discloses the first pin junction part further comprises a second i-layer disposed between the first p-layer and first p-layer

and constituted by a mainly amorphous silicon film. (Note lines 45-48 in column 24 of Saitoh et al. '615)

With regard to claim 13, Saitoh et al. '615 discloses the first pin junction part further comprises a second i-layer disposed between the first p-layer and first p-layer and constituted by a mainly amorphous silicon film. (Note lines 45-48 in column 24 of Saitoh et al. '615)

With regard to claim 14, Saitoh et al. '615 discloses the first pin junction part further comprises a second i-layer disposed between the first p-layer and first p-layer and constituted by a mainly amorphous silicon film. (Note lines 45-48 in column 24 of Saitoh et al. '615)

With regards to claims 18-20, Saitoh et al. '615 discloses all the subject matter claimed except for the limitation, wherein the composition ratio between the iron atom and silicon atom in the first i-layer is substantially 1:2.

However, Morimoto et al. discloses the limitation, wherein a composition ratio between the iron atom Fe and silicon Si atom in an amorphous layer is in a range from 1:1.7 to 1:3.5 ("$FeSi_2$"). (Note lines 58-68 col 3)

Therefore, it would have been obvious to one of ordinary skill in the art to form the transducer of Saitoh et al. '615 with the limitation of Morimoto et al. in order to have excellent electrical and optical characteristics.

Claims 6 and 15-17 are rejected under 35 U.S.C 103(a) as being unpatentable over Saitoh et al. (5,741,615) in view of Saitoh et al. (5,417,770).

With regard to claim 6, Saitoh et al. '615 disclose all the subject matter claimed except for a second pin junction part, disposed in series with the first pin junction part, including: a second p-layer; a second n-layer disposed so as to oppose the second p-layer; and a third i-layer disposed between the second p-layer and second n-layer and made of an amorphous silicon film.

However, figure 9 of Saitoh et al. '770 discloses a second pin junction part (907, 908, 909), disposed in series with the first pin junction (904, 905, 906) part, including: a second p-layer 909; a second n-layer 907 disposed so as to oppose the second p-layer 909; and a third i-layer (bottom of 908) disposed between the second p-layer 909 and second n-layer 907 and made of an amorphous silicon film. (Note lines 37-41 in column 32 of Saitoh et al.)

Therefore, it would be obvious to one of ordinary skill in the art to form the device of Saitoh et al. '615 with the second pin of Saitoh et al. '770 in order to absorb different wavelengths.

With regard to claim 15, Saitoh et al. '615 discloses all the subject matter claimed except for a second pin junction part, disposed in series with the first pin junction part, including: a second p-layer; a second n-layer disposed so as to oppose the second p-layer; and a third i-layer disposed between the second p-layer and second n-layer and made of an amorphous silicon film.

However, figure 9 of Saitoh et al. '770 discloses a second pin junction (907, 908, 909) part, disposed in series with the first pin junction (904, 905, 906) part, including: a second p-layer 909; a second n-layer 907 disposed so as to oppose the second p-layer

909; and a third i-layer 908 disposed between the second p-layer 909 and second n-layer 907 and made of an amorphous silicon film. (Note lines 37-41 in column 32 of Saitoh et al.)

Therefore, it would be obvious to one of ordinary skill in the art to form the device of Saitoh et al. '615 with the second pin of Saitoh et al. '770 in order to absorb different wavelengths.

With regard to claim 16, Saitoh et al. '615 discloses all the subject matter claimed except for a second pin junction part, disposed in series with the first pin junction part, including: a second p-layer; a second n-layer disposed so as to oppose the second p-layer; and a third i-layer disposed between the second p-layer and second n-layer and made of an amorphous silicon film.

However, figure 9 of Saitoh et al. '770 discloses a second pin junction (907, 908, 909) part, disposed in series with the first pin junction (904, 905, 906) part, including: a second p-layer 909; a second n-layer 907 disposed so as to oppose the second p-layer 909; and a third i-layer 908 disposed between the second p-layer 909 and second n-layer 907 and made of an amorphous silicon film. (Note lines 37-41 in column 32 of Saitoh et al.)

Therefore, it would be obvious to one of ordinary skill in the art to form the device of Saitoh et al. '615 with the second pin of Saitoh et al. '770 in order to absorb different wavelengths.

With regard to claim 17, Saitoh et al. '615 discloses all the subject matter claimed except for a second pin junction part, disposed in series with the first pin junction part,

including: a second p-layer; a second n-layer disposed so as to oppose the second p-layer; and a third i-layer disposed between the second p-layer and second n-layer and made of an amorphous silicon film.

However, figure 9 of Saitoh et al. '770 discloses a second pin junction (907, 908, 909) part, disposed in series with the first pin junction (904, 905, 906) part, including: a second p-layer 909; a second n-layer 907 disposed so as to oppose the second p-layer 909; and a third i-layer 908 disposed between the second p-layer 909 and second n-layer 907 and made of an amorphous silicon film. (Note lines 37-41 in column 32 of Saitoh et al.)

Therefore, it would be obvious to one of ordinary skill in the art to form the device of Saitoh et al. '615 with the second pin of Saitoh et al. '770 in order to absorb different wavelengths.

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin T. Liu whose telephone number is (571) 272-6009. The examiner can normally be reached on Mon-Fri 9:30 AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue A. Purvis can be reached on 571 272 1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BTL
4/16/2007